BSC 2460 CAN WE DESIGN BETTER HUMANS? SHOULD WE?

Instructor

Dr. Brian Harfe

Email

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Office Hours

Monday, 8:00 - 9:00 am; Wednesday, 3:00 - 4:00 pm or by appointment. Online through Zoom Conferences (or in person). **Please send me an email for the Zoom address.**

Teaching Assistants

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Use email messages for personal questions ONLY (such as individual grades, special circumstances, or needed accommodations). Expect a response within 24-48 hours on weekdays (not including holidays or emergency closures).

If you wish to send an email to the entire instructor team, please CC: ALL TAs in your email.

COURSE INFORMATION

This course will be held entirely online in Canvas. This course accomplishes the Quest objectives of the subject areas listed below. A minimum grade of C is required for Quest credit. Courses intended to satisfy the Quest requirement cannot be taken S-U.

- Quest 2
- International (N)

Credit Hours: 3

COURSE DESCRIPTION

The creation of a human that has specific traits or superhuman abilities has been a central theme in science fiction for decades. An outstanding example of a "created" superhuman comes from the iconic story of a how a scrawny kid from the Lower East Side of Manhattan in 1940 was transformed into Captain America. While a body-altering "super serum" seems unlikely, especially in a time period where penicillin was just starting to be widely used, is the creation of a superhuman possible using our current understanding of the human body?

For >70 years it has been known that the DNA present in each one of our cells is the blueprint that makes us human. In 2003, the blueprint (I.e., the "human genome") was made freely available to the entire world. Contained within this blueprint are the directions responsible for making every part of the human body, and controlling how it works. Upon publishing of the human genome, it became possible, in theory, to modify specific parts of our blueprint to generate a human with specific characteristics (i.e., a "designer human"). But should we?

In this course, we will explore two broad questions: 1. Can a human be created that has specific characteristics and 2. Should we design "better" humans? We will examine the technologies behind how the human genome can be modified and discuss the controversies surrounding these technologies. Both of these questions will be addressed through an international lens since many of the scientific breakthroughs that allow us to even ask the above questions, and the resulting ethical discussion surrounding these discoveries, were developed outside the US.

COURSE GOALS

At the end of the course, you will have an understanding of what is currently possible and impossible in the field of human cloning. You will be able to lead discussions with your peers on the ethical questions surrounding this rapidly advancing field, interpret new breakthroughs, and understand how manipulation of the human genome may affect their, and the public's, future health.

COURSE REQUIREMENTS

REQUIRED READINGS/WORKS

Chasing Captain America: How Advances in Science, Engineering, and Biotechnology Will Produce a Superhuman by Paul Zehr, (2018) 224 pages

The Double Helix: A Personal Account of the Discovery of the Structure of DNA by James D. Watson (Note: 2001 version, not the 1968 version) 256 pages

The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race by Walter Isaacson (2021) Select chapters from the 560-page book

Movie: *GATTACA* (1997; 1hr 46 minutes)

Can be viewed through Amazon Prime, YouTube, Google Play Movies, Apple TV, or Vudu.

All other readings and works are available in Canvas.

Optional Readings/Videos

Rosalind Franklin: The Dark Lady of DNA by Brenda Maddox (2003) 416 pages

Biography of the scientist who provided the key piece of information Watson and Crick needed to decipher the structure of DNA "but who was airbrushed out of the greatest scientific discovery of the twentieth century" (Brenda Maddox).

Foundation (2021 TV series on Apple TV+).

While the series is only loosely based on the novels by Isaac Asimov, there is an interesting storyline that revolves around human cloning (as an aside, this storyline is not part of the Asimov books).

PREREQUISITES

There are no prerequisites for this course.

MINIMUM TECHNOLOGY REQUIREMENTS

The University of Florida expects students entering an online program to acquire computer hardware and software appropriate to their degree program. Most computers are capable of meeting the following general requirements. A student's computer configuration should include:

- Webcam
- Microphone
- Broadband connection to the internet and related equipment (cable/DSL modem)
- Microsoft Office Suite installed (provided by the university)

Individual colleges may have additional requirements or recommendations, which students should review before starting their program.

MINIMUM TECHNICAL SKILLS

To complete your tasks in this course, you will need a basic understanding of operating a computer and using word processing software.

MATERIALS/SUPPLY FEES

There is no supply fee for this course.

ZOOM

Zoom is an easy-to-use video conferencing service available to all UF students, faculty, and staff that allows for meetings of up to 100 participants.

You can find resources and help using Zoom at the [University of Florida's ZoomLinks to an external site.](#) website.

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

COURSE POLICIES

Requirements for make-up exams, assignments, and other work in this course are consistent with university policies that can be found on [UF's Attendance PoliciesLinks to an external site.](#) website.

As this is an online class, you are responsible for observing all posted due dates and are encouraged to be self-directed and take responsibility for your learning.

LATE SUBMISSION POLICIES

- **Assignments and quizzes** - can be submitted with **no penalty** up to two weeks after the due date (exceptions below).
- **Team project assignment** - late submissions will **not** be accepted, as you should be working and communicating with your team regularly.
- **Discussion posts** - late submissions will **not** be accepted, as the purpose and goal of discussions necessitate timely interaction with your peers.
- **Pre-course reflection paper** - late submissions will **not** be accepted, as the purpose of this assignment is to capture your thoughts and opinions before you have interacted with the course content.
- **Course surveys** - late submissions will **not** be accepted.
- **Final paper** - late submissions will **not** be accepted, as this assignment is due on the last day of the course.

GRADING POLICY

I will make every effort to have each assignment graded and posted two weeks after the due date.

GRADE BREAKDOWN

% of Final Grade	Course Component
6%	Course surveys
6%	Initial thoughts on human cloning Paper
10%	Discussions in Perusall
15%	Human cloning team project
20%	Weekly quizzes
19%	Reflections on Human Cloning: Final Project
24%	Assignments

Please note that all Assignments for the week should be completed **before** attempting the weekly Quiz. The weekly Quiz can only be taken once and contains questions from the material presented in the week's lectures and from the week's assigned material.

GRADING SCALE

Percent	Grade	Grade Points
94 - 100%	A	4.00
90 - 93%	A-	3.67
87 - 89%	B+	3.33
84 - 86%	B	3.00

Percent	Grade	Grade Points
80 - 83%	B-	2.67
77 - 79%	C+	2.33
74 - 76%	C	2.00
70 - 73%	C-	1.67
67 - 69%	D+	1.33
64 - 66%	D	1.00
60 - 63%	D-	0.67
<60%	E	0.00

See the current UF grading policiesLinks to an external site. for more information.

Grade Rounding

Final grades will be rounded **up** to the nearest whole number. For example, if your final grade is a 93.5, I will round up to an "A", but if your final grade is a 93.4, it will be an "A-". No exceptions will be made.

STUDENT LEARNING OUTCOMES (SLOS)

At the end of this course, students will be expected to have achieved the QuestLinks to an external site. learning outcomes as follows:

Content: *Students demonstrate competence in the terminology, concepts, theories, and methodologies used within the discipline(s).*

- Identify, describe, and explain the ways that human cloning and genetics are currently being used both in the US and internationally (Quest 2, N). **Assessments:** Participation in class discussions, complete weekly quizzes that contain questions about assigned material and lectures, participation in weekly canvas-based discussions, and a final paper.
- Identify, describe, and explain the ways that human cloning and the genetic manipulation of human DNA has impacted human society. (Quest 2, N) **Assessments:** Participation in class discussions, complete weekly quizzes that contain questions about assigned material and lectures, participation in weekly canvas-based discussions, final paper.

Critical Thinking: *Students carefully and logically analyze information from multiple perspectives and develop reasoned solutions to problems within the discipline(s).*

- Critically analyze, evaluate, and compare US and international policy on human cloning and the genetic modification of humans. (Quest 2, N) **Assessments:** Participation in class discussions, assignments such as questions about the reading, and the team project.
- Critically assess what is currently possible in human cloning and genetics, and evaluate possible ethical issues that will arise from future discoveries. (Quest 2, N) **Assessments:** Discussion questions about the reading and film assigned, Team project, final paper

- Critically interpret global and intercultural issues in human cloning (Quest 2, N). **Assessments:** Personal views of global awareness survey, final project.
- Analyze how generative AI can be used and evaluate the weaknesses and strengths of this developing technology. **Assessments:** final project.

Communication: *Students communicate knowledge, ideas and reasoning clearly and effectively in written and oral forms appropriate to the discipline(s).*

- Communicate in writing and orally on how you can incorporate your knowledge of human cloning to educate the public on the benefit and risks associated with this evolving area of public health. (Quest 2, N) **Assessments:** Team project policy paper, final project.
- Effectively communicate with members of other cultures. (Quest 2, N) **Assessments:** Personal views of global awareness survey, group project

Connection: *Students connect course content with meaningful critical reflection on their intellectual, personal, and professional development at UF and beyond.*

- Reflect on what you have learned in the course and develop a way to connect with the public on these issues. (Quest 2) **Assessments**: Team project and policy paper.

Reflect upon how you can incorporate your knowledge of human cloning in your future health. (Quest 2) **Assessments:** Final paper

UF POLICIES

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES

Students with disabilities requesting accommodations should first register with the Disability Resource CenterLinks to an external site. (352-392-8565) by providing appropriate documentation. Once registered, students will receive an accommodation letter that must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

UNIVERSITY POLICY ON ACADEMIC CONDUCT

UF students are bound by The Honor Pledge, which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code." On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Student Honor Code and Student Conduct CodeLinks to an external site. specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

PLAGIARISM

The Student Honor Code and Student Conduct CodeLinks to an external site. states that:

"A Student must not represent as the Student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

- Stealing, misquoting, insufficiently paraphrasing, or patch-writing.
- Self-plagiarism, which is the reuse of the Student's own submitted work, or the simultaneous submission of the Student's own work, without the full and clear acknowledgment and permission of the Faculty to whom it is submitted.
- Submitting materials from any source without proper attribution.
- Submitting a document, assignment, or material that, in whole or in part, is identical or substantially identical to a document or assignment the Student did not author."

NETIQUETTE AND COMMUNICATION COURTESY

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

- Security
- General Guidelines
- Email
- Discussion Boards
- Zoom

Remember that your password is the only thing protecting you from pranks or more serious harm.

- Don't share your password with anyone.
- Change your password if you think someone else might know it.
- Always log out when you are finished using the system.

GETTING HELP

TECHNICAL DIFFICULTIES

For help with technical issues or difficulties with Canvas, please contact the UF Computing Help Desk at:

- http://helpdesk.ufl.eduLinks to an external site.
- 352-392-HELP (4357)
- Walk-in: HUB 132

Any requests for make-ups (assignments, exams, etc.) due to technical issues should be accompanied by the ticket number received from the UF Computing Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You should email your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

HEALTH AND WELLNESS

- **U Matter, We Care**: If you or someone you know is in distress, please email umatter@ufl.edu, call 352-392-1575, or visit U Matter We CareLinks to an external site. to refer or report a concern, and a team member will reach out to the student in distress.
- **Counseling and Wellness Center:** Visit the UF Counseling & Wellness CenterLinks to an external site. website or call 352-392-1575 for information on crisis services and non-crisis services.
- **Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the UF Student Health Care CenterLinks to an external site. website.
- **University Police Department**: Visit the UF Police DepartmentLinks to an external site. website or call 352-392-1111 (or 9-1-1 for emergencies).
- **UF Health Shands Emergency Room/Trauma Center:** For immediate medical care in Gainesville, call 352-733-0111, or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Shands Emergency Room/Trauma CenterLinks to an external site. website.

ACADEMIC AND STUDENT SUPPORT

- **Career Connections Center:** For career assistance and counseling services, visit the UF Career Connections CenterLinks to an external site. website or call 352-392-1601.
- **Library Support:** For various ways to receive assistance concerning using the libraries or finding resources, visit the UF George A. Smathers Libraries Ask-A-LibrarianLinks to an external site. website.
- **Teaching Center:** For general study skills and tutoring, visit the UF Teaching CenterLinks to an external site. website or call 352-392-2010.
- **Writing Studio:** For help with brainstorming, formatting, and writing papers, visit the University Writing Program Writing StudioLinks to an external site. website or call 352-846-1138.

TIPS FOR SUCCESS

Taking a course online can be a lot of fun! Here are some tips that will help you get the most of this course while taking full advantage of the online format:

- Schedule "class times" for yourself. It is important to do the coursework on time each week. You will receive a reduction in points for work that is turned in late!
- Read ALL of the material contained on this site. There is a lot of helpful information that can save you time and help you meet the objectives of the course.
- Print out the Course Summary located in the Course Syllabus and check things off as you go.
- Take full advantage of the online discussion boards. Ask for help or clarification of the material if you need it.
- Do not wait to ask questions! Waiting to ask a question might cause you to miss a due date.
- Do your work well before the due dates. Sometimes things happen. If your computer goes down when you are trying to submit an assignment, you'll need time to troubleshoot the problem.
- To be extra safe, back up your work to an external hard drive, thumb drive, or through a cloud service.

OPTIONAL STUDY ABROAD TRIP

CLASS MEETINGS

- Students will travel abroad during the Spring 2025 semester AFTER classes/exams end and BEFORE Summer A begins (Sunday, May 4th, 2025 – Sunday, May 11th, 2025). **This is officially a Spring 2025, one-credit course.**
- Students WILL be back in Gainesville to take classes, in person, in Summer A/C if they would like.
- We will meet once, TBD, in Gainesville, FL, during the Spring 2025 semester before the start of the program.
- Location of study abroad: Edinburgh, Glasgow, the "highlands of Scotland"*, and London, England.

*"Choose your adventure." See activities for Tuesday, May 6th, below.

INSTRUCTOR

- Brian Harfe, Ph.D.
- Email: bharfe@ufl.edu

PREREQUISITES

- None
- **The course is open to all majors**
- Open to all UF undergraduates, including freshman

COURSE DESCRIPTION

The course aims to provide an introductory international experience and allow students to explore some of the scientific discoveries that have changed the world (in person!), including a visit to Dolly, the world's first cloned animal (Edinburgh, Scotland), and the original Watson and Crick model of DNA (London, England). Participation in this course requires no science background, **and all majors are welcome.** During the one-week course, students will travel to Edinburgh, Glasgow, the Highlands of Scotland*, and London, England. Most afternoons and evenings are designated "free time" to explore these fantastic places! The attached document includes some places students have visited. See: "Things to do on the UF in the UK trip!

"

Students will also explore two universities, the University of GlasgowLinks to an external site. and the University of London (UCL)Links to an external site., which they can attend the following year as exchange students. On the "free day," students also have the option of exploring the University of Aberdeen, which you can also attend as an exchange studentLinks to an external site.. All exchange programs are run by Dr. Brian Harfe, the faculty member directing this study abroad program. The opportunity to spend a semester/academic year abroad is available to all students, irrespective of whether they participate in the Study Abroad program. However, preference will be given to students who have participated in this study abroad program.

SCHEDULE AND DATES FOR THE 2026 STUDY ABROAD PROGRAM

Dates are Sunday, May 3ʳᵈ, 2026 (Edinburgh, Scotland arrival) – Sunday, May 10ᵗʰ, 2026 (depart London, England)

To be in Edinburgh on Sunday, May 3ʳᵈ, you will likely need to leave the US on Saturday, May 2ⁿᵈ (overnight flight). You can, of course, show up earlier and meet us in Edinburgh on Sunday, May 3ʳᵈ. You can also leave after May 10ᵗʰ, the last day of the trip (you would miss the start of summer A/C).

Sunday, May 3ʳᵈ (Edinburgh, Scotland):

- AM: Arrive in Edinburgh, Scotland (we will take the Edinburgh tramLinks to an external site. from the airport to the hotel)
- PM: Group lunch and orientation to Edinburgh (Dr. Harfe)
- PM: Explore the city! (hotel in Edinburgh).

Monday, May 4ᵗʰ (Edinburgh, Scotland):

- 9:30 am: Visit Edinburgh CastleLinks to an external site.
- PM: Visit the National Museum of ScotlandLinks to an external site.. At the museum, see DollyLinks to an external site., the first cloned animal.
- In the evening, you have free time to explore the Royal Mile and EdinburghLinks to an external site. (hotel in Edinburgh).

Tuesday, May 5ᵗʰ, FREE DAY (*students are responsible for the cost of activities on this day. I have put some suggestions below)

 Suggestions for trips/things to do (so many possibilities!):

- Tripadvisor day trip suggestionsLinks to an external site. (an excellent place to get some ideas)
- Day trip to the Highlands of Scotland, including visiting Urquhart Castle and Loch NessLinks to an external site.! Several students went on this trip previously (~$75)
- Day trip to Aberdeen, Scotland, including Aberdeen UniversityLinks to an external site., where you can (through UF) spend the entire semester or academic year if you would like! (round-trip train is ~$110).
- Day trip to Newcastle UniversityLinks to an external site., where you can (through UF) spend the entire semester or academic year if you would like! (round-trip train is ~$50).
- StirlingLinks to an external site., Scotland, and Stirling CastleLinks to an external site. (round-trip train is ~$30)
- Andrews, Scotland. Home of golfLinks to an external site., an amazing (ruined) CathedralLinks to an external site., and a vibrant townLinks to an external site.. (round-trip train is ~$30. Keep in mind the train stop is called "Leuchars" which is outside of town).

Wednesday, May 6th (Glasgow, ScotlandLinks to an external site.):

Day trip to Glasgow (1-hour train ride from Edinburgh to Glasgow).

- AM: Guided walking tour of Glasgow University. You can apply (through UF) to spend the entire academic year hereLinks to an external site. if you would like (or a semester)!
- AM: Visit The Hunterian MuseumLinks to an external site., located on the University of Glasgow Campus. The Hunterian Museum includes permanent exhibits on "Medicine in Glasgow – Past and PresentLinks to an external site." and "Lord Kelvin: Revolutionary ScientistLinks to an external site.."
- PM: Explore Glasgow City Centre (shopping!). In the evening, take the train back to Edinburgh (hotel in Edinburgh)

Thursday, May 7th (London, England):

- AM: Train to London (4.5 hours). Arrive at London Kings Cross Station. Yes, there is a Platform 9 ¾.Links to an external site.
- PM: Orientation to London and explore the city on your own.

Friday, May 8th (London, England):

- AM: British MuseumLinks to an external site. (lunch at the museum or the surrounding area)
- PM: Walking tour of the University of London (UCL)Links to an external site. for students interested in attending UCL as a UF exchange student.Links to an external site. Or explore the city on your own.

Saturday, May 9th (London, England):

- AM: Visit the Science Museum, LondonLinks to an external site.. This is an incredible place with exhibits spanning the COVID pandemic to one of the world's oldest clocks (from the 1300s). At the museum, see:
  - The original Watson and Crick model of DNALinks to an external site..
  - The "most significant medical collection in the worldLinks to an external site.."

- o The museum also has an outstanding selection of early microscopes and computers!
- o And one of the world's most famous exhibits on all things "SpaceLinks to an external site." (as in exploring places not on Earth).
- PM: Explore the city on your own.

Sunday (May 10th): Fly from London home.

COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available on the GatorEvals Providing Constructive FeedbackLinks to an external site. FAQ page. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the GatorEvalsLinks to an external site. website. Summaries of course evaluation results are available to students at the GatorEvals Public ResultsLinks to an external site. page. More information about UF's course evaluation system can be found at the GatorEvals Faculty EvaluationsLinks to an external site. website.

PRIVACY AND ACCESSIBILITY POLICIES

For information about the privacy policies of the tools used in this course, see the links below:

- Adobe
    - o Adobe Privacy PolicyLinks to an external site.
    - o Adobe AccessibilityLinks to an external site.

- Course Reserves
    - o Course Reserves Privacy PolicyLinks to an external site.
    - o Course Reserves AccessibilityLinks to an external site.
- Google Docs
    - o Google Privacy PolicyLinks to an external site.
    - o Google AccessibilityLinks to an external site.
- Grammarly
    - o Grammarly Privacy PolicyLinks to an external site.
    - o Grammarly AccessibilityLinks to an external site.
- Instructure (Canvas)
    - o Instructure Privacy Policy
    - o Instructure Accessibility
- Microsoft
    - o Microsoft Privacy PolicyLinks to an external site.
    - o Microsoft AccessibilityLinks to an external site.
- Perusall
    - o Perusall Privacy PolicyLinks to an external site.
    - o Perusall AccessibilityLinks to an external site.
- Sonic Foundry (Mediasite Streaming Video Player)
    - o Sonic Foundry Privacy PolicyLinks to an external site.
    - o Sonic Foundry AccessibilityLinks to an external site. (PDF)
- YouTube (Google)
    - o YouTube (Google) Privacy PolicyLinks to an external site.

- o YouTube (Google) AccessibilityLinks to an external site.

- Zoom
  - o Zoom Privacy PolicyLinks to an external site.
  - o Zoom AccessibilityLinks to an external site.

(Links to an external site.